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# Owlet Moths (Phalaenidae) Taken at Light Traps in Kansas and Nebraska[1]

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United States Department of Agriculture, Bureau of Entomology and Plant Quarantine, in Cooperation with the Nebraska Agricultural Experiment Station.

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## INTRODUCTION

The information contained in this publication was obtained through the operation of light traps located at six widely separated points in the Missouri Basin, in areas typical of both the semiaried and humid phases of the agriculture of this region. It deals with the seasonal occurrence and abundance of the owlet moths (Phalaenidae (Noctuidae)), a group composed largely of such notoriously injurious pests as the corn earworm, the pale western cutworm, the western armyworm, the wheat-head armyworm, and many other seriously injurious cutworms inhabiting the region surveyed. This region is of exceptional interest to workers in applied entomology because it contains an owlet moth fauna representing not only the strictly subterranean species, controllable only by modification of cultural practices, but those possessing either intermediate or surface-inhabiting characteristics, and more or less amenable to insecticidal treatment.

The data herein contained, revealing the distribution, seasonal flight periods, and peaks of abundance of the various species, are basic to, or of value in, the consideration of cultural control and other methods for the suppression of the various pests involved.

The use of light traps offered an efficient means of obtaining this information. Accordingly, in the fall of 1934 traps were set up in

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several locations and their operation was continued during the flight seasons of 1935–37. A record of the nightly catch was kept, the species, number of moths captured, and the proportion of the sexes being tabulated. The traps were put in operation early enough in the spring so that the first flights could be observed, and they were kept in operation until cold weather in the fall stopped all flight activity.

Observations were made in the following six localities: Cherryvale, Garden City, Hays, and Manhattan in Kansas and Lincoln and Scottsbluff in Nebraska (fig. 1). These localities ranged in elevation

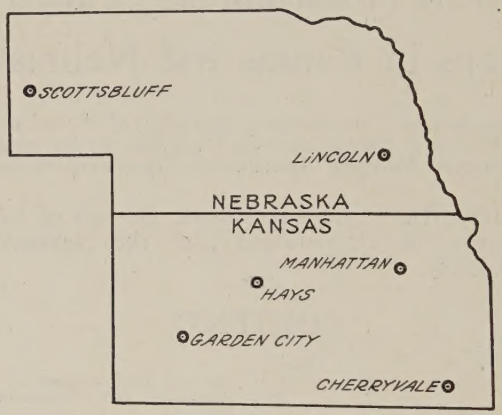


FIGURE 1.—Location of the light traps.

as follows: Cherryvale 800 feet, Garden City 2,800 feet, Hays 2,000 feet, Manhattan 1,100 feet, Lincoln 1,200 feet, and Scottsbluff 3,900 feet.

## TRAPS

With the exception of the one used at Manhattan, the traps were of similar type and were designed by the senior writer. They consisted of an inverted galvanized-iron cone, 2 feet in diameter, with a roof of the same material. The lamp (fig. 2, *B*) was suspended in the center just above the rim, and a fruit jar was attached to the bottom of the cone for receiving the catch. The killing agent, calcium cyanide, was put in a small sack and placed in the fruit jar. The cyanide was renewed daily.

The trap used at Manhattan (fig. 2, *A*) was designed by R. C. Smith, of the Kansas Agricultural Experiment Station. Except for a more shallow cone, and the use of glass buffers about the lamp, this trap was the same as those at the other localities. Five-hundred-watt clear lamps were used at Manhattan and Lincoln and 200-watt inside-frosted lamps elsewhere.

The locations of the traps were probably not ideal, but the availability of electric outlets was the deciding factor in the selection of sites. These were as follows:

(1) At Cherryvale the location was unsatisfactory. It was on a flour mill that was illuminated nearly every night and near a transformer station that was always brilliantly lighted. The competition of these other lights greatly affected the catches, and the results from this trap are not considered of much value.

(2) At Garden City the trap was located on the grounds of the Garden City Branch Station, Kansas Agricultural Experiment Station, about 5 miles northeast of the city. The light was visible in all directions, although a small grove of trees on the southwest somewhat obscured it in that direction. It was placed about 5 feet above the ground.

(3) At Hays the trap was placed in an open space between buildings on the grounds of the Fort Hays Branch Station, Kansas Agricultural Experiment Station. It was about 5 feet above the ground and was visible for a long distance to the east and south.

(4) At Manhattan the trap was placed on top of an outbuilding near the college power plant. The lamp was about 20 feet above the ground and could be seen for

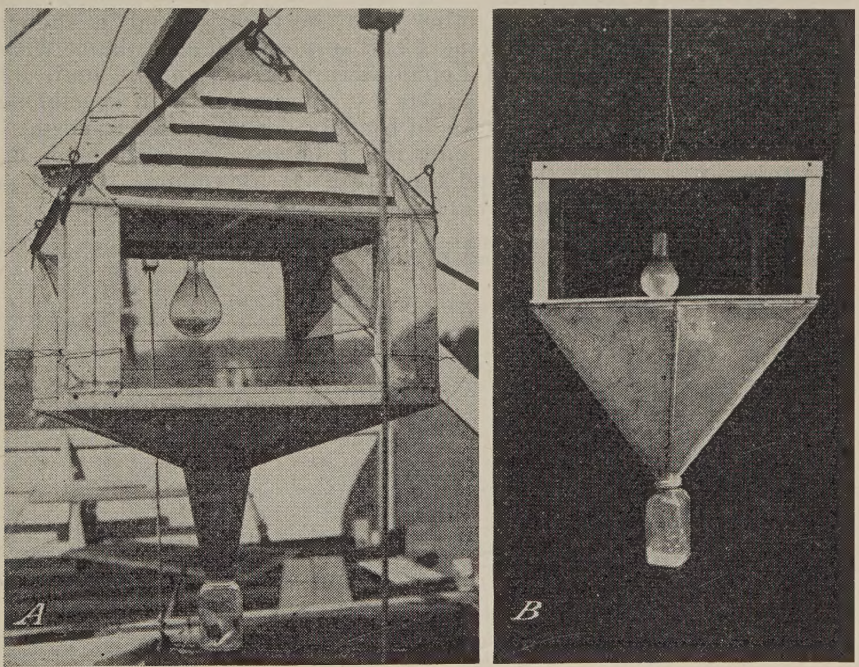


FIGURE 2.—Light trap used at Manhattan, Kans. (*A*), and at the other locations (*B*).

some distance to the west, south, and north, but was obscured by buildings on the east.

(5) At Lincoln the trap was placed at the east edge of the Nebraska Agricultural Experiment Station orchard, well within the city limits. It commanded a view to the east for some distance, but in other directions the light was obscured by the orchard trees nearby.

(6) At Scottsbluff the trap was located on the grounds of the Scottsbluff Branch Station, Nebraska Agricultural Experiment Station, about 6 miles northwest of the city. The trap was elevated about 10 feet above the ground and was visible for a long distance in all directions.

## COLLECTIONS

The several light traps were in operation for various periods during the 4 years. Except for certain unavoidable interruptions, they were operated each night throughout the flight season.[2] The catches from Cherryvale, Garden City, Hays, and Scottsbluff were forwarded to

[2] The traps at Manhattan and Lincoln were operated by the writers and those at Cherryvale, Garden City, Hays, and Scottsbluff by the N. Sauer Milling Co., F. A. Wagner, L. C. Aicher, and John Carter, respectively.

either Manhattan or Lincoln, where the material was sorted and the results were tabulated. The number of nights for which records were obtained are as follows: Cherryvale 202, Garden City 612, Hays 214, Manhattan 629, Lincoln 656, and Scottsbluff 406.

It was at first intended to record all species of Phalaenidae taken at the several traps. Limitations of time, however, made it necessary to omit some of the smaller forms and the species of the genus *Catocala*, and in 1937 only species of known economic importance were recorded from Manhattan and Garden City. Altogether 305 species were taken and 525,547 individuals. The total yearly catch of each species for the different localities, together with the flight period, is shown in table 1. The sequence of genera and species is in accordance with McDunnough's Check list of Lepidoptera.[3] Much of the material was identified by the writers, largely by comparison with specimens determined by J. F. Gates Clarke, of the Division of Insect Identification, Bureau of Entomology and Plant Quarantine, Rowland R. McElvare, New York City, and the late F. H. Benjamin. Credit is due these men for their careful and painstaking work.

[3] McDUNNOUGH, J. CHECK LIST OF THE LEPIDOPTERA OF CANADA AND THE UNITED STATES OF AMERICA. PART I. MACROLEPIDOPTERA. South. Calif. Acad. Sci. Mem. 1,275 pp. 1938.

TABLE 1.—*Phalaenid moths caught in light traps at various localities in Kansas and Nebraska, 1934–37*

| Species | Flight period | Number of moths caught | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cherryvale, Kans., | Manhattan, Kans. | | | | Hays, Kans. | | Garden City, Kans. | | | | Lincoln, Nebr. | | | Scottsbluff, Nebr. | | |
| | | Apr. 8 to Oct. 31, 1935 | Sept. 8 to Dec. 5, 1934 | Mar. 13 to Nov. 1, 1935 | Apr. 8 to Oct. 30, 1936 | Apr. 12 to Oct. 15, 1937 | Sept. 26 to Oct. 30, 1934 | Apr. 5 to Oct. 30, 1935 | Sept. 28 to Nov. 23, 1934 | Mar. 24 to Nov. 20, 1935 | Apr. 10 to Oct. 31, 1936 | Apr. 12 to Nov. 12, 1937 | Mar. 14 to Oct. 28, 1935 | Apr. 9 to Oct. 31, 1936 | Apr. 13 to Oct. 30, 1937 | July 13 to Oct. 19, 1935 | May 3 to Oct. 31, 1936 | May 17 to Oct. 18, 1937 |
| Pantheinae: | | | | | | | | | | | | | | | | | | |
| *Raphia abrupta* Grt | Apr.–June | | | 1 | 21 | | | | | | 3 | | | 13 | 50 | | 48 | 13 |
| *R. coloradensis* Putn | June | | | | | | | | | | | | | | | | 7 | |
| Acronictinae: | | | | | | | | | | | | | | | | | | |
| *Acronicta rubricoma* Guen | May–Aug | | | 4 | 10 | | | | | | | | | 3 | 1 | | | |
| *A. americana* (Harr.) | May–Sept | | 2 | | 30 | | | | | | | | | 8 | 2 | | 1 | |
| *A. lepusculina* Guen | Apr.–Sept | 3 | | 12 | 30 | | | | | | 5 | | 7 | 19 | 15 | | 18 | 1 |
| *A. parallela* (Grt.) | Apr.–Oct | 4 | 12 | 74 | 73 | | 26 | 49 | 1 | 43 | 17 | | 182 | 389 | 43 | | 2 | 4 |
| *A. connecta* Grt | Apr.–July | | | 2 | | | | | | | | | | | | | | |
| *A. vinnula* (Grt.) | Apr.–Sept | 1 | | 3 | 13 | | | | | | | | | 1 | 7 | | 1 | |
| *A. morula* G. and R | Apr.–July | 4 | | 2 | 4 | | | | | | | | | 1 | 3 | | 1 | |
| *A. interrupta* Guen | Apr.–Sept | | | 2 | 1 | | | | | | | | | | | | | |
| *A. lobeliae* Guen | Apr | | | 1 | | | | | | | | | | | | | | |
| *A. pruni* (Harr.) | Aug | 1 | | | | | | | | | | | | | | | | |
| *A. retardata* (Walk.) | Apr.–June | | | 2 | 1 | | | | | | | | | 35 | | | 2 | |
| *A. caesarea* Sm | May | | | | | | | | | | | | | 1 | | | | |
| *A. brumosa* Guen | Apr | 1 | | | | | | | | | | | | | | | | |
| *A. lithospila* Grt | July | | | 1 | | | | | | | | | | | | | | |
| *A. oblinita* (A. and S.) | Apr | | | | 1 | | | | | | | | 1 | | | | | |
| *Simyra henrici* (Grt.) | Apr.–May | | | 1 | 1 | | | | | | | | | | | | | |
| Phalaeninae (Agrotinae): | | | | | | | | | | | | | | | | | | |
| *Euxoa ciccata* (Sm.) | Oct | | | 1 | | 5 | 256 | 211 | 34 | 39 | 31 | 531 | | 1 | | 20 | 117 | 81 |
| *E. olivia* (Morr.) | Sept.–Oct | | | | | | | | | | | 6 | | 2 | | 26 | 260 | 99 |
| *E. brevipennis brevistriga* Sm. | do | | | | | | | | | | | | | | | | 35 | 21 |
| *E. cicatricosa* (G. and R.) | Sept | | | | | | | | | | | | | | | | 13 | 1 |
| *E. niveilinea* (Grt.) | Aug.–Oct | | 14 | 4 | 2 | 51 | 159 | 59 | 3,694 | 150 | 111 | 3,082 | 12 | 65 | 145 | 280 | 460 | 290 |
| *E. quadridentata* (G. and R.) | Sept | | | | | | | | | | | | | | | | | 18 |
| *E. atristrigata* (Sm.) | July | | | | | | | | | | | | | | | 1 | | |
| *E. catenula* (Grt.) | Aug.–Oct | | | | | | | | | | | | | | 2 | 1 | | 3 |
| *E. pallipennis* (Sm.) | Sept.–Oct | | | | | | | 1 | | | | | | | 2 | 50 | 567 | 54 |
| *E. mitis ura* Sm | Sept | | | | | | | | | | | | | | | 1 | | |
| *E. aurulenta* f. *aurulentoides* (Strand.) | May–June | | | | | | | | | | | | | | 2 | | 26 | |
| *E. detersa* (Walk.) | July–Oct | | 3 | 16 | 3 | 8 | 1 | 3 | | 1 | 1 | 23 | | 1 | 2 | 25 | 48 | 22 |
| *E. intrita* (Morr.) | July | | | | | | | | | | | | | | | | 1 | |

TABLE 1.—*Phalaenid moths caught in light traps at various localities in Kansas and Nebraska, 1934–37*—Continued

| Species | Flight period | Number of moths caught | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cherryvale, Kans., Apr. 8 to Oct. 31, 1935 | Manhattan, Kans. | | | | Hays, Kans. | | Garden City, Kans. | | | | Lincoln, Nebr. | | | Scottsbluff, Nebr. | | |
| | | | Sept. 8 to Dec. 5, 1934 | Mar. 13 to Nov. 1, 1935 | Apr. 8 to Oct. 30, 1936 | Apr. 12 to Oct. 15, 1936 | Sept. 26 to Oct. 30, 1934 | Apr. 5 to Oct. 30, 1935 | Sept. 28 to Nov. 23, 1934 | Mar. 24 to Nov. 20, 1935 | Apr. 10 to Oct. 31, 1936 | Apr. 12 to Nov. 12, 1937 | Mar. 14 to Oct. 28, 1935 | Apr. 9 to Oct. 31, 1936 | Apr. 13 to Oct. 30, 1937 | July 13 to Oct. 19, 1935 | May 3 to Oct. 31, 1936 | May 17 to Oct. 18, 1937 |
| Phalaeninae (Agrotinae)—Con. | | | | | | | | | | | | | | | | | | |
| *E. immixta* (Grt.) | May–July | | | 227 | 312 | 774 | | | | | 1 | | 25 | 132 | 152 | 1 | 8 | 21 |
| *E. velleripennis* (Grt.) | Sept.–Oct | | 1 | | | | | | | | | | 1 | 3 | | | | 1 |
| *E. scandens* (Riley) | May–Aug | | | | | | | | | | | | | 1 | 1 | 51 | 251 | 242 |
| *E. medialis poncha* Sm | Oct | | | 2 | | | | | | | | | | | | | | |
| *E. placida* B. and McD | do | | 3 | | | | | | | | | | | | | | | |
| *E. mimallonis* (Grt.) | Aug | | | | | | | | | | | | | | | 1 | | |
| *E. messoria* (Harr.) | June–Oct | | 8 | 2 | 9 | 22 | 1 | | | 6 | 6 | 29 | 79 | 157 | 230 | 100 | 77 | 10 |
| *E. recticincta* (Sm.) | Sept.–Oct | | | | | | 35 | 75 | 137 | 14 | 1 | 7 | | | | 3 | 2 | |
| *E. tessellata* (Harr.) | May–Aug | | | | 1 | | | | | | 1 | | | 9 | 7 | 14 | 342 | 80 |
| *E. tessellata tesselloides* (Grt.) | Oct | | | | | | | | | | | | | | 1 | | | |
| *E. remota* (Sm.) | July | | | | | | | | | | | | | 3 | 1 | | 37 | |
| *E. simona* McD | June | | | | | | | | | | 2 | | | | | | 1 | |
| *E. declarata* (Walk.) | July–Sept | | | | | | | | | | | | | | | 30 | | |
| *E. verticalis* (Grt.) | July | | | | | | | | | | | | | | | | 1 | |
| *E. albipennis* (Grt.) | June–Sept | | | | | | | | | | | | | | 3 | | | 18 |
| *E. obeliscoides* (Guen.) | July–Oct | | 1 | | | | 3 | | | | | | 4 | 1 | 6 | | | |
| *E. costata idahoensis* (Grt.) | July | | | | | | | | | | | | | | | | | 1 |
| *E. clausa* McD | June | | | | | | | | | | | | | | | | 2 | |
| *E. tristicula* (Morr.) | May–Aug | | | | | | | | | | 4 | | | | 1 | 8 | 269 | 76 |
| *E. tristicula nesilens* Sm | May | | | | | | | | | | | | | | | | 1 | |
| *Chorizagrotis auxiliaris* Grt. | Apr.–Oct | 1 | 307 | 1,769 | 72 | 181 | 560 | 2,839 | 2,058 | 18,062 | 28,300 | 12,775 | 90 | 210 | 288 | 285 | 909 | 1,020 |
| *C. auxiliaris montanus* Cook | July | | | | | | | | | 16 | | | | | | 1 | | |
| *C. thanatologia* (Dyar) | May–Oct | | | | | | | | 1 | 2 | | | | | | | | |
| *C. thanatologia perfida* (Dod.) | do | | | | | | | | | 3 | | | | | | | | |
| *Protexarnis balanitis* (Grt.) | Sept | | | | | | | | | | | | | | | 2 | | |
| *Loxagrotis apicalis* (Grt.) | do | | 20 | 14 | 12 | | | 31 | | 1 | 1 | | 5 | 1 | 3 | | | |
| *L. albicosta* (Sm.) | Aug.–Oct | | | | | | | | 2 | | | | | | | 7 | 1 | |
| *Onychagrotis rileyana* (Morr.) | Aug.–Oct | 3 | 139 | 96 | 101 | 1,221 | 98 | 25 | 52 | 7 | 10 | 31 | 39 | 250 | 1,111 | 169 | 661 | 402 |
| *Eucoptocnemis fimbriaris* (Guen.) | Oct | | | | 1 | | | | | | | | | | | | 1 | 1 |
| *E. tripars* (Walk.) | do | | | 1 | | | | | | | | | | | | | | 1 |
| *Agrotis vetusta* Walk | Sept.–Oct | | 14 | 10 | 2 | 14 | 101 | 23 | 562 | 250 | 108 | 414 | 1 | 1 | 4 | 147 | 161 | 65 |
| *A. daedalus* (Sm.) | Apr.–June | | | 2 | 1 | | | 3 | | 56 | 49 | | 3 | | | | 39 | 14 |
| *A. orthogonia* Morr | Aug.–Oct | | | | | | 36 | 14 | 395 | 24 | 69 | 489 | | | | 16 | 64 | 19 |
| *A. gladiaria* Morr | Sept.–Oct | 34 | 185 | 310 | 208 | 4,062 | | 2 | | | | | 77 | 316 | 291 | | 4 | 2 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *A. venerabilis* Walk. | do | 156 | 276 | 459 | 428 | 3,171 | 892 | 100 | 71 | 2 | 3 | 21 | 679 | 1,171 | 2,701 | 240 | 413 | 211 |
| *A. volubilis* Harv. | May-July | | | | | | | | | | | | | | | | 126 | 38 |
| *A. malefida* Guen. | June-Nov. | 1 | 2 | 2 | 3 | 2 | 2 | | 26 | 34 | 73 | 13 | | | | | | |
| *A. ypsilon* (Rott.) | Mar.-Nov. | 131 | 14 | 201 | 53 | 382 | 28 | 93 | 590 | 800 | 1,179 | 768 | 107 | 75 | 620 | 24 | 14 | 17 |
| *Feltia subgothica* (Haw.) | Aug.-Oct. | 228 | 1,031 | 4,344 | 1,263 | 1,522 | 1,737 | 2,957 | 52 | 198 | 268 | 341 | 1,181 | 6,317 | 3,487 | 292 | 279 | 186 |
| *F. annexa* (Treit.) | Apr.-Oct. | 90 | | 92 | 74 | 53 | | 3 | 10 | 3 | 49 | 10 | 1 | 9 | 24 | | | |
| *Copablepharon grandis* Stkr. | July-Sept. | | | | | | | | | 3 | 5 | | | | | 3 | 61 | 1 |
| *C. contrasta* McD. | Aug. | | | | | | | | | | | | | | | | | 1 |
| *C. longipenne* Grt. | do | | | | | | | | | | | | | | | | 6 | |
| *C. alba* (Harv.) | June-Aug. | | | | | | | | | | | | | | | 2 | 13 | |
| *Spaelotis clandestina* (Harr.) | June-July | | | | | | | | | | | | | | | 1 | 4 | 2 |
| *S. havilae* (Grt.) | June-July | | | | | | | | | | | | | | | | 4 | |
| *Choephora fungorum* G. and R. | Sept.-Oct. | 49 | 2 | 14 | | | | | | 1 | | | | | | | | |
| *Anicla infecta* (Ochs.) | July-Aug. | | | 1 | 2 | | 1 | | | | 2 | | | | 1 | | | |
| *Hemieuxoa rudens* (Harv.) and f. *pellucidalis* (Grt.) | Apr.-Sept. | | | 1 | 2 | | | 3 | | 6 | 9 | | | | 11 | | | 4 |
| *Cerastis tenebrifera* (Walk.) | Apr. | | | | | | | | | | | | | | 1 | | | |
| *Peridroma margaritosa* Haw. and f. *saucia* (Hbn.). | Mar.-Nov. | 93 | 22 | 761 | 356 | 4,683 | 6 | 77 | 49 | 727 | 1,055 | 2,224 | 455 | 420 | 2,197 | 77 | 71 | 357 |
| *Caradrina quadrangula clemens* (Sm.). | May | | | | | | | | | | | | | | | | 1 | |
| *Amathes c-nigrum* (L.) | May-Oct. | 1 | 1 | 47 | 123 | 113 | | | 1 | 17 | 16 | 50 | 21 | 48 | 197 | 27 | 48 | 8 |
| *A. badinodis* (Grt.) | Sept.-Oct. | 39 | 24 | 41 | 26 | 41 | 2 | | | | | | 12 | 30 | 25 | | | |
| *Pseudoglaea olivata* (Harv.) | Sept. | | | | | | | | | | | | | | | | 1 | |
| *Abagrotis placida* (Grt.) | July | | | | | | | | | | | | | | | | 1 | |
| *A. barnesi* (Benj.) | June-Sept. | 1 | | | 3 | 2 | | | | 3 | | | | | | 5 | 8 | 10 |
| *Rhynchagrotis cupida* (Grt.) | July | | | | | | | | | | | | | | | | 1 | |
| *Ufeus satyricus* Grt. | Oct. | | | | | | | | 3 | | | | | | | | 1 | |
| *U. plicatus* Grt. | do | | | | | | | | | | | | | | 1 | | | |
| Hadeninae: | | | | | | | | | | | | | | | | | | |
| *Scotogramma trifolii* (Rott.) | Mar.-Nov. | 153 | 861 | 3,677 | 1,100 | 984 | 89 | 3,615 | 498 | 86,661 | 75,021 | 42,325 | 970 | 2,492 | 8,295 | 1,396 | 742 | 403 |
| *S. trifolii olb fusa* (Walk.) | May | | | | | | | | | | | | | | 2 | | 1 | |
| *Trichoclea postica* Sm. | June-Aug. | | | | | | | | | | 1 | | | 2 | 1 | | | |
| *T. artesta* Sm. | do | | | | | | | | | | | | | | | | 10 | |
| *Polia legitima* (Grt.) | June-Sept. | 4 | 6 | 15 | 5 | | | | | | | | 1 | 4 | | | 1 | 3 |
| *Lacinipolia meditata* (Grt.) | do | | 3 | 9 | 21 | | | 76 | | | | | 57 | 102 | 28 | 1 | | 1 |
| *L. anguina* (Grt.) | Apr. | | | 5 | | | | | | | | | | | | | | |
| *L. incurva* (Sm.) | do | | | | 1 | | | | | | | | | | | | | |
| *L. vicina* (Grt.) | May-Oct. | | 32 | 43 | 7 | | 233 | 101 | | 2 | 1 | | | 12 | 2 | 4 | 7 | 2 |
| *L. renigera* (Steph.) | do | 33 | 2 | 23 | 65 | | | | | | | | 211 | 1,011 | 60 | 7 | 5 | 3 |
| *L. erecta* (Walk.) | Apr. | | | | 1 | | | | | | | | | | | | | |
| *L. lorea* (Guen.) | June | | | | | | | | | | | | | 1 | | | 1 | |
| *L. olivacea* (Morr.) | Aug. | | | | | | | | | | | | | | | 2 | | |
| *L. marinitincta* (Harv.) | Sept.-Oct. | 2 | 5 | 8 | 2 | | | | | | | | | | | | | |
| *Anepia capsularis* (Guen.) | May | | | 1 | 2 | | | | | | | | | | | | | |
| *Tricholita signata* (Walk.) | Aug. | | | | | | | | | | | | | 1 | | | | |
| *Ulolonche culea* (Guen.) | May | | | 2 | | | | | | | | | | | | | | |
| *U. modesta disticha* (Morr.) | Sept. | | | | | | 2 | | | | | | | | | | | |
| *Orthodes akalus* (Stkr.) | do | | | | | | 1 | | | | | | | | | | | |
| *O. incincta* (Morr.) | July-Oct. | 16 | 51 | 104 | 83 | 141 | 10 | 16 | | 1 | | | 36 | 91 | 103 | 117 | 98 | 9 |
| *O. saturnus* (Stkr.) | Sept.-Oct. | | 2 | | | | | | | | | | | | | | | |
| *O. crenulata* (Butl.) | May-June | 3 | | | 6 | | | | | | | | | 3 | | | 8 | |

TABLE 1.—*Phalaenid moths caught in light traps at various localities in Kansas and Nebraska, 1934–37*—Continued

| Species | Flight period | Number of moths caught | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cherryvale, Kans., Apr. 8 to Oct. 31, 1935 | Manhattan, Kans. | | | | Hays, Kans. | | Garden City, Kans. | | | | Lincoln, Nebr. | | | Scottsbluff, Nebr. | | |
| | | | Sept. 8 to Dec. 5, 1934 | Mar. 13 to Nov. 1, 1935 | Apr. 8 to Oct. 30, 1936 | Apr. 12 to Oct. 15, 1937 | Sept. 26 to Oct. 30, 1934 | Apr. 5 to Oct. 30, 1935 | Sept. 28 to Nov. 23, 1934 | Mar. 24 to Nov. 20, 1935 | Apr. 10 to Oct. 31, 1936 | Apr. 12 to Nov. 12, 1937 | Mar. 14 to Oct. 28, 1935 | Apr. 9 to Oct. 31, 1936 | Apr. 13 to Oct. 30, 1937 | July 13 to Oct. 19, 1935 | May 3 to Oct. 31, 1936 | May 17 to Oct. 18, 1937 |
| Hadeninae—Continued. | | | | | | | | | | | | | | | | | | |
| *O. furfurata* (Grt.) | May | | | 1 | | | | | | | | | | | | | | |
| *Nephelodes emmedonia* (Cram.) | Sept.–Oct | 20 | 22 | 27 | 58 | 116 | 9 | | 1 | | | 1 | 14 | 25 | 51 | 2 | 2 | 3 |
| *Xylomyges* sp | May | | | | | | | | | | | | | | | | | |
| *Orthosia garmani* (Grt.) | Apr | | | | 1 | | | | | | | | | | | | 1 | |
| *O. hibisci* f. norm. *insciens* Walk. | do | | | | | | | | | 1 | | | | 1 | 5 | | | |
| *Ceramica picta* (Harr.) | Apr.–Oct | 1 | | 9 | 39 | 12 | | 6 | | | 7 | 3 | 9 | 33 | 102 | 119 | 27 | 32 |
| *Protoleucania rubripennis* (G. and R.) | Aug.–Sept | 1 | 15 | | 1 | | | | | 9 | 1 | | | | | | | |
| *P. albilinea* (Hbn.) | Mar.–Oct | 139 | 63 | 1,440 | 477 | 327 | 33 | 1,118 | 32 | 1,023 | 403 | 649 | 339 | 1,120 | 413 | 71 | 55 | 15 |
| *Leucania phragmatidicola* Guen. | Apr.–Oct | 20 | 8 | 211 | 159 | 266 | 5 | 82 | 18 | 98 | 104 | 15 | 36 | 107 | 108 | 17 | 16 | 3 |
| *L. unipuncta* (Haw.) | Apr.–Nov | 1,029 | 381 | 4,107 | 273 | 3,357 | 145 | 152 | 613 | 577 | 450 | 2,250 | 1,035 | 822 | 3,140 | 113 | 48 | 252 |
| Cuculliinae: | | | | | | | | | | | | | | | | | | |
| *Cucullia speyeri* Lint | May–June | | | | | | | | | | | | | | 4 | | | |
| *C. laetifica* Lint | Apr.–Oct | 4 | | 172 | 41 | | | 71 | | 24 | 173 | | 3 | 9 | 10 | | 2 | |
| *C. asteroides* Guen | May–Sept | | | 34 | 15 | | | 1 | | | 1 | | 1 | | | | 2 | |
| *Nycterophacta luna* (Morr.) | May–Aug | | | | | | | | | | | | | | | 3 | 13 | 59 |
| *Oncocnemis balteata* Sm | Aug | | | | | | | | | | | | | | | | 1 | |
| *O. iricolor* Sm | Sept.–Oct | | | 1 | | | | | | | | | | | | | | 11 |
| *O. sanina* Sm | do | | 1 | | | | 48 | | 91 | 5 | 6 | | | | | 367 | 481 | 143 |
| *O. augustus* Harv | do | | | | | | | 1 | | | 25 | | | | | 91 | 146 | 3 |
| *O. saundersiana* Grt | Oct | | | | 1 | | | | | | | | | | | | | |
| *O. occata* (Grt.) | Apr.–Oct | | | 36 | 3 | | | | | 1 | 7 | | | | 11 | | 2 | 2 |
| *O. riparia* Morr | May–June | | | | 10 | | | | | | | | | | | | | |
| *O.* sp. nov | Sept | | | | | | | | | | | | | | | 1 | | |
| *Homohadena badistriga* (Grt.) | June | | | | | | | | | | | | | 1 | | | | |
| *H. stabilis* Sm | May–June | | | 9 | 43 | | | | | | | | | 26 | 1 | 11 | 19 | |
| *H. infixa dinalda* Sm | May–July | | | 58 | 101 | | | | | | | | 1 | 3 | 11 | | | |
| *Adita chionanthi* (A. and S.) | Sept.–Oct | | 4 | 11 | 6 | | 18 | 7 | | | | | 3 | 36 | 30 | | 1 | |
| *Psaphidia grotei* (Morr.) | Mar.–Aug | 4 | | 29 | 16 | | | 1 | | | | | 1 | 210 | 37 | | 53 | |
| *Eutolype depilis* (Grt.) | Apr | | | | 2 | | | | | | | | | | | | | |
| *E. rolandi* (Grt.) | do | | | | 2 | | | | | | | | | | | | | |
| *Graptolitha georgii* (Grt.) | Apr.–Oct | | | | | | | | | | | | | 1 | | | 4 | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *G. unimoda* (Lint.) | Oct | | | | | | | | | | | | | | | 4 | | | |
| *Fishia betsia* (Sm.) | do | | | | | | | | | | | | | | | | 1 | | |
| *Rusina bicolorago* (Guen.) | do | 2 | 5 | 10 | 1 | | | | 3 | 2 | | | 2 | 3 | 9 | | | | 1 |
| *Anathix agressa* (Sm.) | do | | | 1 | | | | | 2 | | | | | | | | | | |
| *Homoglaea carbonaria* (Harv.). | do | | | | | | | 1 | | | | | | | | | 1 | 1 | |
| Amphipyrinae: | | | | | | | | | | | | | | | | | | | |
| *Septis relicina* (Morr.) | Oct | | | | | 1 | | | | | | | | | | | | | |
| *S. arctica* (Feyer) | June | | | | | | | | | | | | | | | | | 1 | |
| *S. inordinata montana* (Sm.) | May–Sept | | | | | | | | | | | | | | | | | 45 | 15 |
| *Agroperina helva* (Grt.) | July–Sept | 1 | | | 1 | | | | | | | | | | | | | | 1 |
| *Crymodes devastatrix* (Brace). | do | | 1 | | | | | | | 1 | 1 | | | 4 | | 9 | 1 | | |
| *C. burgessi* (Morr.) | Sept.–Nov | | 99 | 54 | 14 | | | 934 | 25 | | | | 26 | 122 | 158 | 24 | 2 | 3 | |
| *Trichoplexia virguncula* (Sm.). | May–Aug | | | | | | | | | | | | | | | | | 67 | 35 |
| *Protagrotis niveivenosa* (Grt.). | July | | | | | | | | | | | | | | | | 1 | 12 | 7 |
| *Luperina innota* Sm | Sept | | | | | | | | | | | | | | | | 1 | | |
| *L. passer* (Guen.) | June–July | | | | | | | | | | | | | | | | | 2 | 1 |
| *L.* sp. nov | Sept.–Oct | | | 5 | | | | | | | | | | | | | | | |
| *Archanara oblonga* (Grt.) | Aug | | | | | | | | | | | | | | | | 1 | | |
| *A. subflava* (Grt.) | do | | | | | | | | | | | | | | | | 1 | | |
| *Ipimorpha subvexa* (Grt.) | July–Aug | | | | | | | | | | | | | | | | 1 | 1 | |
| *Apamea* sp | July | | | | | | | | | | | | | | | | | 1 | |
| *Papaipema serrata* (Grt.) | July–Aug | | | | | | | | | | | | | | | | | 4 | |
| *P. circumlucens* (Sm.) | Oct | 9 | 1 | 1 | | | | | | | | | | | 1 | | | | |
| *P. nebris* Guen. and f. *nitela* Guen. | Sept.–Oct | 66 | 3 | 7 | 7 | 6 | 10 | | 1 | | | | 1 | | 2 | | | | |
| *P. maritima* Bird | Oct | | | | 1 | | | | | | | | | | | | | | |
| *Trachea delicata* (Grt.) | May–July | 1 | | | 2 | | | | | | | | | 5 | 1 | | | 2 | 1 |
| *Phosophila miselioides* (Guen.). | June–July | | | 2 | 2 | | | | | | | | | | | | | | |
| *Amphipyra pyramidoides* Guen. | Sept | | | | | | | | | | | | | | | | | 2 | |
| *A. glabella* (Morr.) | June–Aug | | | | | | | | | | | | | | | | 2 | 5 | |
| *Dipterygia scabriuscula* (L.) | Apr.–Sept | 1 | 2 | 9 | 15 | | | | | | 1 | | 3 | 72 | 9 | 1 | | | |
| *Delta ramosula* (Guen.) | July–Aug | 3 | | 3 | | | | | | | | | | | | | | | |
| *Andropolia diversilineata* (Grt.). | July | | | | | | | | | | | | | | | | | 1 | |
| *Perigea xanthioides* Guen | May–Sept | | | 6 | 65 | | | | | | | | 1 | 10 | 16 | | | 1 | |
| *Platysenta videns* (Guen.) | May–Aug | | | | 16 | | | | | | | | | | | | | | |
| *Pl. vecors* (Guen.) | Apr | 1 | | | | | | | | | | | | | | | | | |
| *Pl. sutor* (Guen.) | Sept.–Nov | 4 | 3 | 3 | 1 | | | | | | | | | | | | | | |
| *Elaphria festivoides* f. *varia* (Walk.) | Sept | | | 3 | | | | | | | | | | | | | | | |
| *E. grata* Hbn | May–July | | | 1 | 1 | | | | | | | | | | | | | | |
| *Platyperigea extima* (Walk.) | May–Oct | | | 8 | 2 | | | 3 | | 12 | 11 | | 1 | 16 | 55 | 315 | 690 | 262 | |
| *P. meralis* (Morr.) | Sept.–Oct | | 2 | | | | | | | | | | | | | | | | |
| *Cranbodes talidiformis* Guen. | Apr.–Oct | 1 | 1 | 110 | 1,126 | | | 3 | | 1 | 2 | | 10 | 424 | 291 | 52 | 76 | 37 | |
| *Proxenus miranda* (Grt.) | May–Oct | | | 4 | 24 | | | | | | | | | 57 | 2 | | | | |
| *Galgula partita* Guen | Apr.–Oct | | | | | | | | | | | | | 168 | 793 | | | | |

TABLE 1.—*Phalaenid moths caught in light traps at various localities in Kansas and Nebraska, 1934–37*—Continued

| Species | Flight period | Number of moths caught | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cherryvale, Kans., Apr. 8 to Oct. 31, 1935 | Manhattan, Kaas. | | | Hays, Kans. | | Garden City, Kans. | | | | Lincoln, Nebr. | | | Scottsbluff, Nebr. | | |
| | | | Sept. 8 to Dec. 5, 1934 | Mar. 13 to Nov. 1, 1935 | Apr. 8 to Oct. 30, 1936 | Apr. 12 to Oct. 15, 1936 | Sept. 26 to Oct. 30, 1934 | Apr. 5 to Oct. 30, 1935 | Sept. 28 to Nov. 23, 1934 | Mar. 24 to Nov. 20, 1935 | Apr. 10 to Oct. 31, 1936 | Apr. 12 to Nov. 12, 1937 | Mar. 14 to Oct. 28, 1935 | Apr. 9 to Oct. 31, 1936 | Apr. 13 to Oct. 30, 1937 | July 13 to Oct. 19, 1935 | May 3 to Oct. 31, 1936 | May 17 to Oct. 18, 1937 |
| Amphipyrinae—Continued. | | | | | | | | | | | | | | | | | |
| *G. partita* f. *hepara* Guen. | Apr.–Oct. | | | 2 | | | | | | | | | | 11 | | | |
| *Balsa malana* (Fitch) | May | | | | 2 | | | | | | | | 2 | 55 | | 1 | |
| *Prodenia ornithogalli* Guen. | Mar.–Oct. | 273 | 177 | 1,616 | 503 | 1,669 | 14 | 197 | 62 | 631 | 165 | 240 | 1,683 | 262 | 2,352 | 15 | 5 |
| *Laphygma frugiperda* (A. and S.). | Aug.–Oct. | 23 | 12 | 133 | 31 | 28 | 3 | 5 | 29 | 43 | 17 | 49 | 21 | 3 | 82 | 1 | |
| *L. exigua* (Hbn.) | May–Nov. | 5 | 96 | 332 | 340 | 142 | 37 | 48 | 966 | 285 | 201 | 316 | 36 | 59 | 1,260 | 11 | 7 | 5 |
| *Magusa orbifera* (Walk.) | Aug.–Nov. | 2 | 1 | 3 | | | 1 | | 7 | 6 | 1 | | | | | | | |
| *Enargia decolor* (Walk.) | July | | | | | | | | | | 1 | | | | | | 2 | |
| *Cosmia canescens* f. *calami* (Harv.). | Aug | | | | | | | | | | | | | | | | | 1 |
| *Atethmia substa* Hbn | Oct | | | 2 | | | | | | | | | | | | | | |
| *Arzama obliqua* (Walk.) | July–Aug | | | | | | | | | | | | | | | | | 2 |
| *Pyrrhia umbra* (Hufn.) | May–Aug | | | 4 | 4 | | | | | | | | | | | | 1 | |
| *Erythroecia suavis* (Hy. Edw.). | May–Sept | | 2 | 15 | 30 | | | 33 | | 60 | 21 | | | 4 | 1 | 14 | 12 | 3 |
| *Escaria clauda* Grt | June–July | | | | | | | | | | | | | | | | 2 | |
| *Catabena lineolata* Walk | Apr.–Sept | | | 29 | 242 | | | | | | 1 | | 3 | 139 | 358 | 8 | 36 | 9 |
| *Ogdoconta cinereola* (Guen.) | May–Oct. | 3 | | 24 | 163 | | | | | | | | | 6 | | | 1 | 6 |
| *Selicanis cinereola* Sm | Oct.–Nov. | 3 | 28 | 26 | 5 | | 31 | 4 | 8 | | 2 | | | 1 | 2 | 1 | 1 | |
| *Stibadium spumosum* Grt | June–Sept. | 12 | 2 | 22 | 35 | | | 6 | | | 8 | | 2 | 33 | 30 | 223 | 195 | 168 |
| *Plagiomimicus pityochromus* Grt. | Aug.–Sept. | 14 | | 4 | 47 | | | | | | | | | 3 | 2 | | 1 | 1 |
| *P. expallidus* Grt | Sept | | | 1 | | | | | | | | | | | | | | |
| *Stiria rugifrons* Grt | May–Oct. | 18 | 13 | 107 | 29 | | | 91 | | 181 | 73 | | 1 | 3 | 6 | 155 | 359 | 640 |
| *Basilodes pepita* Guen | Aug.–Sept. | | | | 7 | | | | | | 1 | | | | | | | |
| *B. chrysopis* Grt | Sept | | | | | | | | | 2 | | | | | | | | |
| *B. catharops* Dyar | do | | | | | | | | | | 1 | | | | | | | |
| *Cirrhophanus duplicatus* Sm. | June | | | | | | | | | | | | | | | | 8 | |
| *Stiriodes perflava* (Harv.) | do | | | | | | | | | | | | | 2 | | | | |
| *Pseudacontia crustaria* (Morr.). | May–July | | | | | | | | | | | | | | | | 9 | 33 |
| Heliothinae: | | | | | | | | | | | | | | | | | | |
| *Heliophana bina* (Guen.) | Sept | | | | 2 | | | | | | | | | | | | | |
| *Heliothis chloropha* (Hbn.) | do | | 4 | 1 | 1 | | | | | | | | | | | | | |
| *H. paradoxa* (Grt.) | May–Oct. | 1 | 2 | 138 | 263 | | | 17 | | 20 | 164 | | 13 | 87 | 68 | 1 | 24 | 3 |
| *H. phloxiphaga* G. and R. | Apr.–Sept. | 2 | 1 | 37 | 59 | | | 4 | 1 | 1 | 8 | | 2 | 49 | 33 | | 4 | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *H. armigera* (Hbn.) | Apr.–Nov | 180 | 1,676 | 1,946 | 1,695 | 1,829 | 1,062 | 487 | 701 | 1,035 | 1,219 | 2,186 | 266 | 610 | 2,120 | 45 | 25 | 49 |
| *H. virescens* (F.) | July–Sept | | | 4 | 4 | | | 4 | | 4 | 8 | | | 4 | 1 | 7 | 6 | 2 |
| *Canthylidia scutosa* (Schiff.) | May–Oct | | 11 | 6 | 8 | | 1 | 2 | | 4 | 9 | | 1 | 2 | 2 | 1 | 7 | 1 |
| *Oxylos citrinellus* (G. and R.) | June–Sept | | | 7 | 1 | | | 1 | | 58 | 2 | | | 3 | | 1 | 68 | 2 |
| *Chlorocleptria simplex* Sm | do | | 1 | 5 | 10 | | | 7 | | 158 | 167 | | 1 | | 20 | 21 | 42 | 54 |
| *Dasyspoudaea lucens* (Morr.) | do | | | 30 | 67 | | | | | | | | 1 | 3 | 1 | | 5 | |
| *D. meadi* (Grt.) | May–Aug | | | 3 | 11 | | | 4 | | 140 | 195 | | | 4 | 3 | 11 | 233 | 209 |
| *Rhodophora gaurae* (A. and S.) | May–Oct | 3 | | 94 | 17 | | | 1 | | 1 | | | 4 | 11 | 14 | | 5 | 3 |
| *Thyreion rosea* Sm | May–June | | | | 4 | | | | | | | | | | | | 4 | 2 |
| *Schinia cumatilis* (Grt.) | Aug.–Sept | | | | 131 | | | | | | 6 | | | 1 | | | 1 | 2 |
| *S. hulstia* Tepper | Sept | | | | 7 | 13 | | | | | | | | | 2 | | | |
| *S. reniformis* Sm | July–Aug | | | | | | | | | | | | | | | | 3 | 4 |
| *S. chrysella* (Grt.) | Aug.–Oct | | | 3 | 33 | 5 | | | | | 1 | | | 9 | 1 | | 1 | 2 |
| *S. trifascia* Hbn | Aug | | | | | | | | | | | | | | 7 | | 3 | 4 |
| *S. oleagina* Morr | do | | | | | 6 | | | | | | | | | 3 | | | 1 |
| *S. gracilenta* Hbn | Aug.–Oct | | | 42 | 120 | | | 179 | | 13 | 27 | | 1 | 3 | 2 | | 7 | |
| *S. acutilinea* (Grt.) | Aug | | | | | | | | | | | | | | | | | 4 |
| *S. diffusa* Sm | do | | | | | 3 | | | | | | | | | | | | |
| *S. walsinghami* (Hy. Edw.) | do | | | | | | | | | | | | | | | | | 3 |
| *S. nundina* (Dru.) | Sept | | | 1 | | | | | | | | | | | | | | |
| *S. tertia* (Grt.) | Aug.–Oct | 36 | | 2,043 | 6,624 | | | 1,024 | | 17 | 106 | | 33 | 334 | 79 | 1 | 4 | 6 |
| *S. albafascia* Sm | Aug | | | | | | | | | | | | | | | | | 1 |
| *S. regia* (Stkr.) | July–Sept | | | | 1 | | | 3 | | 2 | 50 | | | | | 1 | 4 | 4 |
| *S. gloriosa* (Stkr.) | Sept | 3 | | 5 | | | | | | | | | | | | | 1 | |
| *S. sanguinea* (Geyer) | Aug | | | | | 1 | | | | | | | | | | | | |
| *S. saturata* (Grt.) | July–Oct | | | 13 | 268 | | | 3 | | | 13 | | | 2 | 2 | | | |
| *S. thoreaui* (G. and R.) | July–Sept | 21 | | 10 | 53 | 10 | | | | | | | | | | | | |
| *S. marginata* (Haw.) | Aug.–Sept | 30 | | 8 | 4 | | | 1 | | | 2 | | | | 2 | | | |
| *S. lora* Stkr | Sept | | | | 6 | | | | | | | | | | | | | |
| *S. bifascia* Hbn | Aug | | | | | | | | | | | | | | 4 | | | |
| *S. ultima* (Stkr.) | Sept | | | | 10 | 5 | | | | | 1 | | | | | | | |
| *S. jaguarina* (Guen.) | May–Sept | 7 | | 965 | 73 | | | 25 | | 27 | 16 | | 22 | 27 | 14 | 8 | 7 | 3 |
| *S. lynx* (Guen.) | June–July | | | | | | | | | | | | | 1 | 1 | | | |
| *S. arcigera* (Guen.) | Aug.–Oct | 2 | 1 | 6 | 11 | | | 1 | | | | | | | | | 3 | |
| *S. bicuspida* Sm | July–Sept | | | 13 | 36 | 2 | | 1 | | | 2 | | | 1 | | | 3 | 2 |
| *S. mortua* (Grt.) | Aug.–Sept | | | | | 3 | | | | | | 2 | | | | | | 3 |
| *S. mortua packardii* (Grt.) | do | 3 | | 8 | 155 | | | 5 | | 15 | 8 | | | | | 3 | 16 | 1 |
| *S. mortua nobilis* (Grt.) | Sept | | 1 | | | | | | | | | | | | | | | |
| *S. sordida* Sm | do | | | | 27 | 22 | | | | | | | | | | | | |
| *S. siren* (Stkr.) | Aug.–Sept | | | 4 | 48 | | | | | 3 | 15 | | | | | | | |
| *S. roseitincta* (Harv.) | June | | | | | | | | | | | | | | | | 4 | 1 |
| *Trichosellus cupes* (Grt.) | June–July | | | | 1 | | | | | 6 | | | | | | | | |
| Acontiinae: | | | | | | | | | | | | | | | | | | |
| *Erastria synochitis* G. and R. | June–July | | | | | | | | | | | | | 2 | | | | |
| *E. carneola* Guen | May–Sept | | | 1 | 77 | | | | | | 1 | | | 395 | 314 | | | 2 |
| *Neorastria apicosa* (Haw.) | June–Sept | | | | 2 | | | | | | | | | 3 | | | | |
| *Chamyris cerintha* (Treit.) | June | | | | | | | | | | | | | 1 | | | | |
| *Amyna octo* (Guen.) | Sept | | | 1 | | | | | | | | | | | | | | |
| *Tarachidia erastrioides* (Guen.) | May–Oct | | | | | | | | | | | | | 1,081 | 944 | | 22 | 10 |
| *T. tenuescens* (Sm.) | Aug | | | | | | | | | | | | | | | | | 1 |
| *T. semiflava* (Guen.) | June | | | | | | | | | | | | | | | | 1 | |

TABLE 1.—*Phalaenid moths caught in light traps in various localities at Kansas and Nebraska, 1934–37*—Continued

| Species | Flight period | Number of moths caught | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cherryvale, Kans., | Manhattan, Kans. | | | | Hays, Kans. | | Garden City, Kans. | | | | Lincoln, Nebr. | | | Scottsbluff, Nebr. | | |
| | | Apr. 8 to Oct. 31, 1935 | Sept. 8 to Dec. 5, 1934 | Mar. 13 to Nov. 1, 1935 | Apr. 8 to Oct. 30, 1936 | Apr. 12 to Oct. 15, 1937 | Sept. 26 to Oct. 30, 1934 | Apr. 5 to Oct. 30, 1935 | Sept. 28 to Nov. 23, 1934 | Mar. 24 to Nov. 20, 1935 | Apr. 10 to Oct. 31, 1936 | Apr. 12 to Nov. 12, 1937 | Mar. 14 to Oct. 28, 1935 | Apr. 9 to Oct. 31, 1936 | Apr. 13 to Oct. 30, 1937 | July 13 to Oct. 19, 1935 | May 3 to Oct. 31, 1936 | May 17 to Oct. 18, 1937 |
| Acontiinae—Continued. | | | | | | | | | | | | | | | | | | |
| *Therasea angustipennis* (Grt.). | May–Aug | | | | | | | | | | | | | | 1 | | 53 | 252 |
| *Acontia aprica* (Hbn.) | May–Oct | | | 197 | 501 | | | 6 | | | | | | 104 | 163 | | 59 | 2 |
| Euteliinae: | | | | | | | | | | | | | | | | | | |
| *Marathyssa inficita* (Walk.) | May–June | | | | 2 | | | | | | | | | | | | 4 | |
| Sarrothripinae: | | | | | | | | | | | | | | | | | | |
| *Baileya australis* Grt | Apr–Sept | | | 3 | 109 | | | | | | | | | 95 | 7 | | 46 | |
| Plusiinae: | | | | | | | | | | | | | | | | | | |
| *Autographa falcifera* (Kby.) | Apr | | | | | | | | | | | | | | 2 | | | |
| *A. falcifera simpler* (Guen.) | Mar–Oct | 10 | | 597 | 284 | | | 72 | | 51 | 12 | | 363 | 486 | 1,743 | 14 | 7 | 35 |
| *A. brassicae* (Riley) | Mar.–Nov | 95 | 137 | 3,512 | 611 | | 5 | 124 | | 219 | 45 | | 1,240 | 262 | 2,663 | 195 | 20 | 36 |
| *A. orygramma* Geyer | Sept | | | | 1 | | | | | | | | | | | | | |
| *A. biloba* (Steph.) | Apr.–Oct | 6 | | 105 | 13 | | | 4 | | 2 | 1 | | 3 | 17 | 102 | | | 6 |
| *A. oo* (Cram.) | do | | 2 | 10 | 3 | | | | | | | | | | | | | |
| *A. precationis* (Guen.) | Apr.–July | | | | 5 | | | | | | | | | | 2 | | | |
| *A. californica* (Speyer.) | May–Oct | | | 1 | 3 | | | | | | | | | | | | | 1 |
| *A. ou* (Guen.) | May–June | | | | | | | | | | | | | | 7 | | | |
| *Plusia aerea* (Hbn.) | May | | | | 2 | | | | | | | | | | | | | |
| *Abrostola urentis* Guen | Apr.–Sept | | | 28 | 154 | | | | | | | | 1 | 10 | 16 | | 2 | |
| Catocalinae: | | | | | | | | | | | | | | | | | | |
| *Parallelia bistriaris* Hbn. | July–Aug | 4 | | | | | | | | | | | | | | | | |
| *Caenurgina crassiuscula* (Haw.) and *C. erechtea* (Cram.) mixed. | Mar.–Nov | 249 | 63 | 2,225 | 696 | 3,620 | 9 | 1,447 | 28 | 1,069 | 872 | 1,997 | 1,200 | 1,082 | 4,827 | 67 | 58 | 117 |
| *Argyrostrotis anilis* (Dru.) | May–Aug | | | 1 | 2 | | | | | | | | | 1 | | | | |
| *Zale lunata* (Dru.) | May–Oct | 5 | | 18 | | | | 1 | | 1 | | | 1 | | 8 | | | |
| *Z. galbanata* (Morr.) | Apr.–July | | | | 15 | | | | | | | | | 6 | 2 | | 1 | |
| *Z. lunifera* (Hbn.) | May–June | | | 2 | | | | | | | | | | | | | | |
| *Matigramma pulverilinea* Grt. | May–Sept | 1 | 1 | 20 | 33 | | | 2 | | | | | | 1 | 2 | | 1 | |
| *Bendis detrahens* (Walk.) | Sept | | | 1 | | | | | | | | | | | 1 | | | |
| *Phoberia atomaris* Hbn | Mar | | | 1 | | | | | | | | | | | | | | |
| *Melipotis indomita* (Walk.) | Apr.–Aug | 6 | | 47 | 4 | | | 6 | | 117 | 371 | | 1 | | 6 | | 1 | |
| *M. jucunda* Hbn | Mar.–Oct | | 1 | 11 | 6 | | 1 | | | 3 | 1 | | | | 5 | | 3 | |
| *Bulia deducta* (Morr.) | May–Aug | | | 12 | 18 | | | 1 | | 10 | 166 | | | | 1 | | 20 | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Drasteria mirifica* (Hy. Edw.). | Apr.–Sept. | | | | | | | | | 5 | 22 | | | | 1 | 6 | 25 | 6 |
| *Drasteria* sp. | July | | | | | | | | | | | | | | | | 1 | |
| *Anticarsia gemmatilis* (Hbn.). | Oct.–Nov. | | 1 | | 1 | | | | | | | | | | | | | |
| *Strenoloma lunilinea* (Grt.) | June | | | | 1 | | | | | | | | | | | | 1 | |
| *Hypsoropha monilis* (F.) | do | 1 | | | | | | | | | | | | | | | | |
| *H. hormos* Hbn. | do | 1 | | | 1 | | | | | | | | | | | | | |
| *H.* sp. nov. | May–June | | | | 2 | | | | | | | | | | | | | |
| *Plusiodonta compressipalpis* Guen. | Apr.–Sept. | | | 2 | 5 | | | | | | | | | | | | | |
| *Alabama argillacea* (Hbn.) | Aug.–Oct. | 170 | 1,372 | 2,704 | 189 | | 11 | 61 | 139 | 48 | 3 | | 136 | 28 | 693 | 1 | 1 | |
| Hypeniinae: | | | | | | | | | | | | | | | | | | |
| *Tathorhynchus angustiorata* (Grt.) | June–Nov. | 13 | 4 | 240 | 39 | | | 50 | | 57 | 87 | | 26 | 11 | 106 | 1 | | 12 |
| *Plathypena scabra* (F.) | June–Oct. | 113 | 2 | 858 | 66 | | | 20 | | 76 | | | 09 | 16 | 162 | | 2 | 1 |
| Herminiinae: | | | | | | | | | | | | | | | | | | |
| *Epizeuxis americalis* (Guen.) | June | | | | | | | | | | | | | | 1 | | | |
| *E. lubricalis* Gey | June–July | | | | | | | | | | | | | 1 | 1 | | | |
| Total | | 3,674 | 7,265 | 37,090 | 21,094 | 28,874 | 5,723 | 16,703 | 10,963 | 113,256 | 111,686 | 70,847 | 11,213 | 21,957 | 43,711 | 5,455 | 9,599 | 6,437 |
| Number of species | | 76 | 70 | 139 | 151 | 41 | 42 | 73 | 37 | 76 | 88 | 29 | 69 | 113 | 126 | 86 | 157 | 112 |

Although the response to light varies with different species, it is probable that the number of individuals recorded is a fairly reliable estimate of the relative abundance of the species. Approximately 90 percent of the total catch was referable to species of economic importance.

## PROPORTION OF THE SEXES

During the course of this study an attempt was made to determine the proportion of the sexes in representative samples of the various species taken. In many cases, however, insufficient material was examined or captured for a reliable estimate to be obtained. The results are presented in table 2. Only those species represented by 25 or more specimens are tabulated, all others being included in one group at the end of the table. Altogether, 36,692 specimens were examined, and of this number 12,902, or 35 percent, were females. It will be seen that the proportion of females varied greatly with different species, ranging from 3 to 60 percent.

TABLE 2.—*Proportion of females among various species of phalaenid moths caught*

| Species | Moths examined | Females | Species | Moths examined | Females |
|---|---|---|---|---|---|
| | *Number* | *Percent* | | *Number* | *Percent* |
| *Acronicta lepusculina* Guen. | 28 | 36 | *Nephelodes emmedonia* (Cram.) | 32 | 3 |
| *A. parallela* (Grt.) | 34 | 35 | *Protoleucania albilinea* (Hbn.) | 918 | 21 |
| *Euxoa siccata* (Sm.) | 256 | 10 | *Leucania phragmatidicola* Guen. | 170 | 46 |
| *E. niveilinea* (Grt.) | 292 | 14 | *L. unipuncta* (Haw.) | 4,160 | 36 |
| *E. immixta* (Grt.) | 50 | 22 | *Cucullia laetifica* Lint | 28 | 25 |
| *E. scandens* (Riley) | 40 | 30 | *Oncocnemis sanina* Sm. | 79 | 19 |
| *E. messoria* (Harr.) | 31 | 33 | *O. augustus* Harv | 31 | 35 |
| *E. recticincta* (Sm.) | 83 | 29 | *O. occata* (Grt.) | 25 | 60 |
| *E. tessellata* (Harr.) | 32 | 44 | *Psaphidia grotei* (Morr.) | 26 | 23 |
| *Chorizagrotis auxiliaris* (Grt.) | 10,672 | 51 | *Crymodes burgessi* (Morr.) | 502 | 6 |
| *Loxagrotis apicalis* (Grt.) | 32 | 31 | *Platyperigea extima* (Walk.) | 30 | 7 |
| *Onychagrotis rileyana* (Morr.) | 262 | 13 | *Prodenia ornithogalli* Guen. | 1,501 | 25 |
| *Agrotis vetusta* Walk. | 293 | 28 | *Laphygma frugiperda* (A. and S.) | 44 | 48 |
| *A. daedalus* (Sm.) | 62 | 15 | *L. exigua* (Hbn.) | 510 | 32 |
| *A. orthogonia* Morr. | 233 | 18 | *Selicanis cinereola* (Guen.) | 67 | 27 |
| *A. gladiaria* Morr. | 185 | 27 | *Heliothis paradoxa* (Grt.) | 32 | 56 |
| *A. venerabilis* Walk. | 984 | 3 | *H. armigera* (Hbn.) | 3,149 | 45 |
| *A. malefida* Guen. | 35 | 43 | *Schinia mortua packardii* (Grt.) | 29 | 21 |
| *A. ypsilon* (Rott.) | 1,012 | 32 | *Autographa falcifera simplex* (Guen.) | 59 | 8 |
| *Feltia subgothica* (Haw.) | 2,767 | 7 | *A. brassicae* (Riley) | 528 | 39 |
| *F. annexa* (Treit.) | 138 | 17 | *Caenurgina crassiuscula* (Haw.) and *C. erechtea* (Cram.) mixed | 1,019 | 33 |
| *Peridroma margaritosa saucia* (Hbn.) | 936 | 36 | All other species | 1,133 | 33 |
| *Amathes c-nigrum* (L.) | 44 | 52 | Total | 36,692 | 35 |
| *A. badinodis* (Grt.) | 27 | 11 | | | |
| *Scotogramma trifolii* (Rott.) | 3,550 | 35 | | | |
| *Lacinipolia meditata* (Grt.) | 74 | 12 | | | |
| *L. vicina* (Grt.) | 272 | 13 | | | |
| *L. renigera* (Steph.) | 51 | 12 | | | |
| *Orthodes incincta* (Morr.) | 145 | 17 | | | |

## SEASONAL FLIGHT RECORDS

Taken as a group, the light-trap records show that Phalaenidae are in flight from early in March to late in November, with periods of heavy flight and scarcity interspersed irregularly throughout the season. The nightly flight of Phalaenidae in the different localities is shown graphically in figures 3, 4, and 5. The nightly flight at Garden City was much greater than at any of the other localities, owing chiefly to the enormous numbers of adults of *Scotogramma trifolii* captured. The numbers of moths taken varied greatly in the different localities, and from year to year, and also as to the time of the year when the

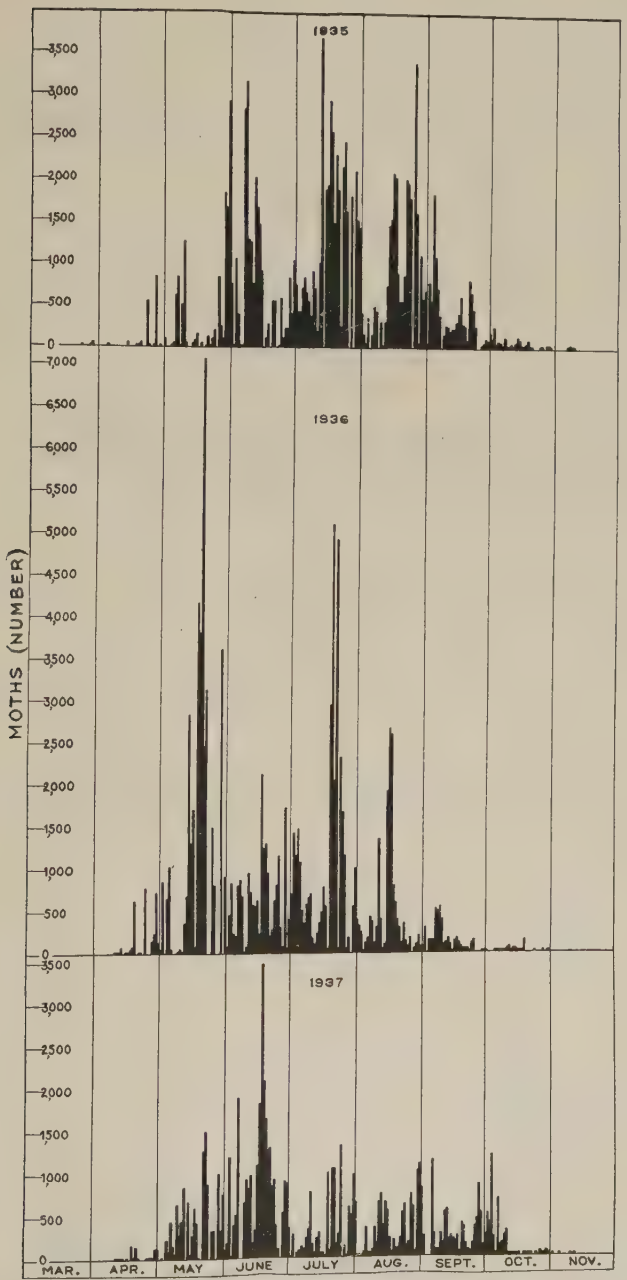


FIGURE 3.—Nightly flight of Phalaenidae at Garden City, Kans., 1935–37.

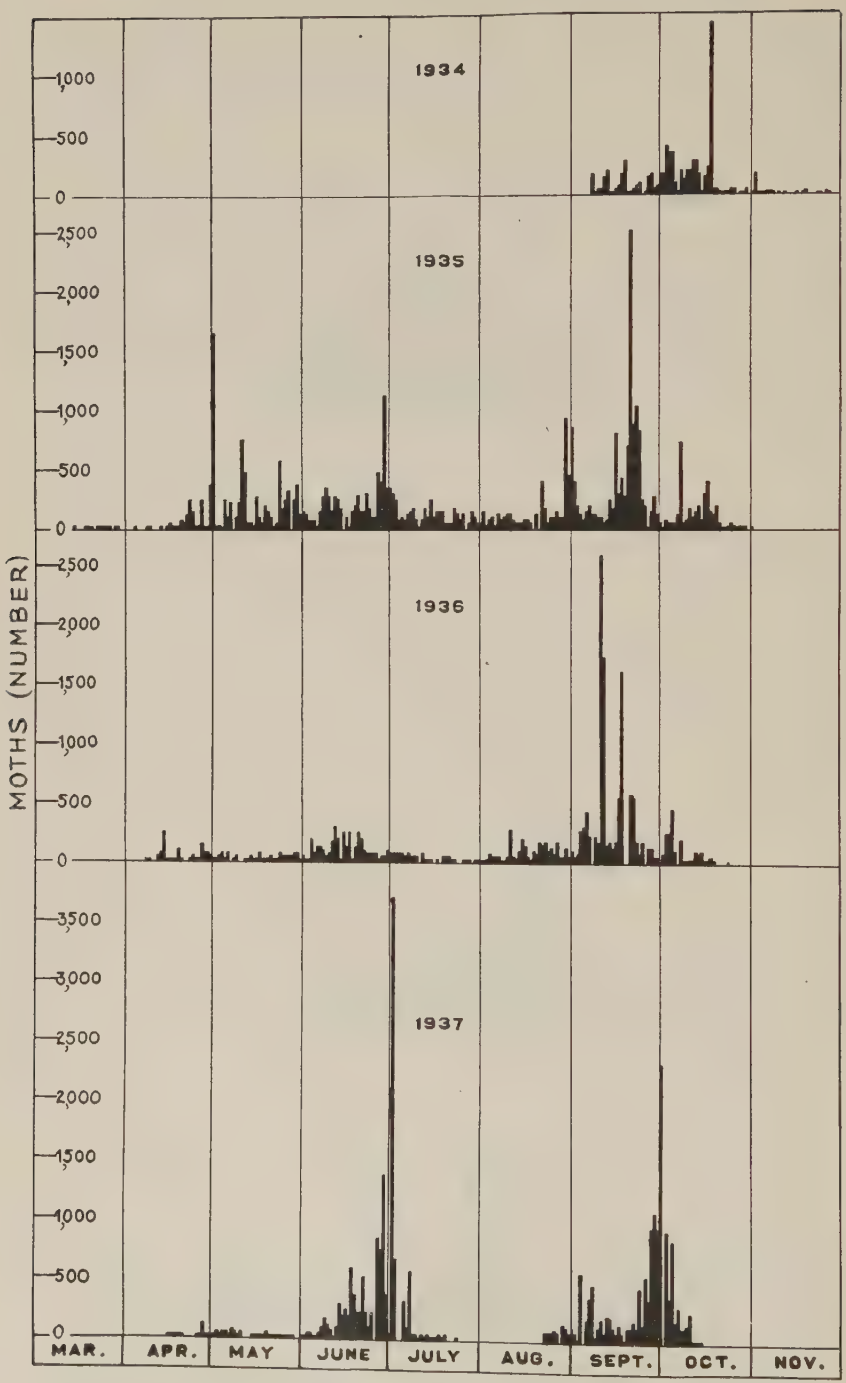


FIGURE 4.—Nightly flight of Phalaenidae at Manhattan, Kans., 1934–37.

period of greatest flight occurs. For example, at Garden City in 1935 the peak flight occurred in July, in 1936 in May, and in 1937 in June.

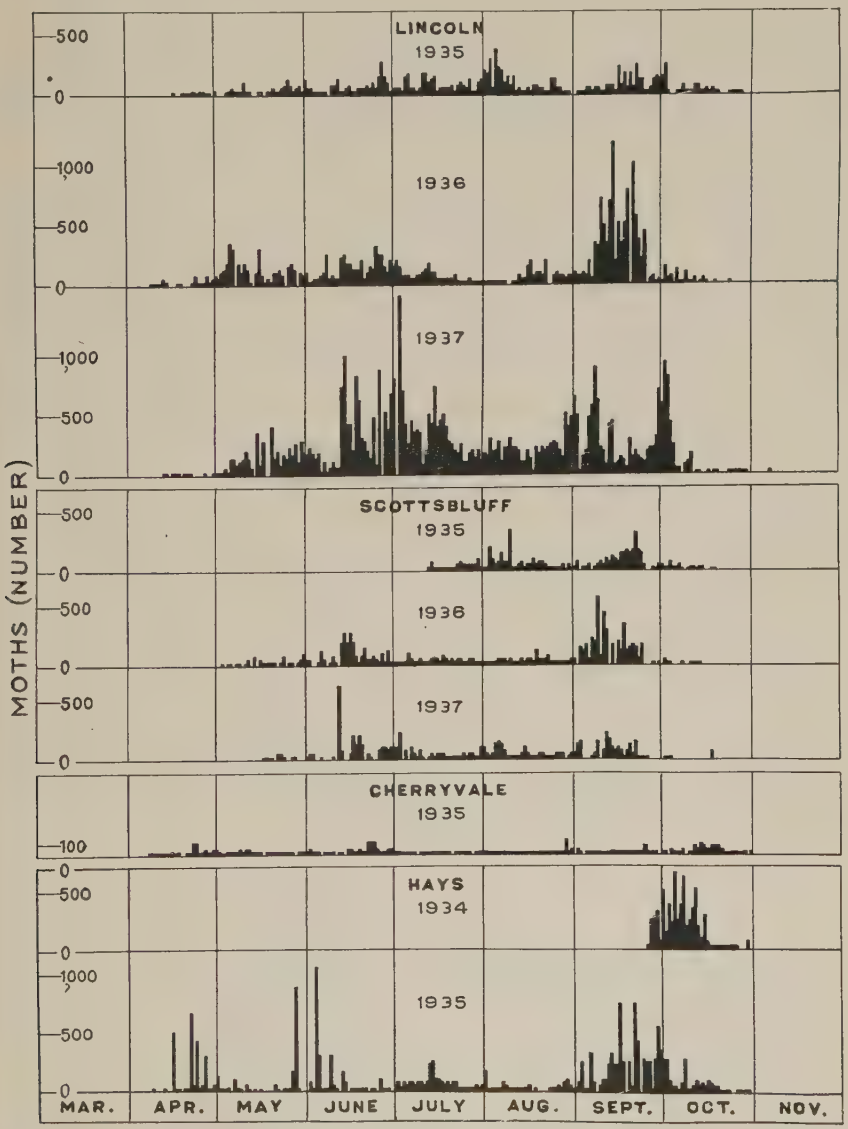


FIGURE 5.—Nightly flight of Phalaenidae at Lincoln and Scottsbluff, Nebr., and at Hays and Cherryvale, Kans., 1934–37.

In other words, there is no definite pattern in the flight periods of the Phalaenidae as a group, largely because individual species vary greatly in numbers from year to year.

## FLIGHT RECORDS OF INDIVIDUAL SPECIES

The species of Phalaenidae fall into two main groups based on their seasonal history, namely, those species producing a single generation annually and those producing more than one generation annually.

As noted previously, species of economic importance comprised 90 percent of the total number of individuals captured. The seasonal flight of several single-generation species of economic importance is shown in figures 6 and 7.

In general, the flight of individual species showed the same trend at all the localities, the chief difference being in numbers taken. Where no striking differences were noted only one locality was plotted on the charts. It will be seen that the species producing a single generation annually have a rather short flight period, usually late in August, extending through September and into the early part of October. The notable exception is *Chorizagrotis auxiliaris*. The enormous flight of this species in May and June suddenly subsides and the species reappears again in September, after an estivation period of about 2 months. The fall flight is greatly reduced in numbers. This species is normally confined to the semiarid regions, but occasionally occurs in abundance at Manhattan (fig. 6, *B*) and at Lincoln. The records for the individual species show the same trend, namely, years of abundance usually followed by years of scarcity.

The seasonal flight of several species producing multiple generations annually is shown in figures 8, 9, 10, and 11. The flight records alone do not delineate clearly the various generations owing to overlapping as the season progresses. The charts, however, bring out some points of interest with reference to the seasonal abundance of multiple-generation species. *Heliothis armigera* (fig. 10, *A*) is shown to be scarce early in the season, with a marked increase in abundance in the fall. With *Prodenia ornithogalli* (fig. 10, *B*) and *Peridroma margaritosa saucia* (fig. 11, *A*) the peak of abundance is reached in midseason, followed by comparative scarcity in the fall. *Protoleucania albilinea* (fig. 11, *B*) shows two distinct flight periods, one early in May and the other late in August or early in September.

## SUMMARY

Light traps were operated for various periods in six localities in Kansas and Nebraska during the period 1934–37, in order to obtain information on the flight periods and abundance of owlet moths (Phalaenidae). An attempt was made to operate the traps each night during the flight season, which extended from March to November. A total of 2,719 nightly records were made.

During the 4-year period 305 species of Phalaenidae were taken, totaling more than 525,000 individuals. Approximately 90 percent of the specimens taken were species of economic importance. The different species taken in each locality are shown, together with the total yearly flight, the flight period, and the proportion of the sexes. More than 36,000 individuals were examined for sex, and it was found that 35 percent were females. The sex ratio varied greatly with the species.

The seasonal flight records are presented graphically for the Phalaenidae as a group and for several species of economic importance. The numbers of moths taken differed greatly in the different localities,

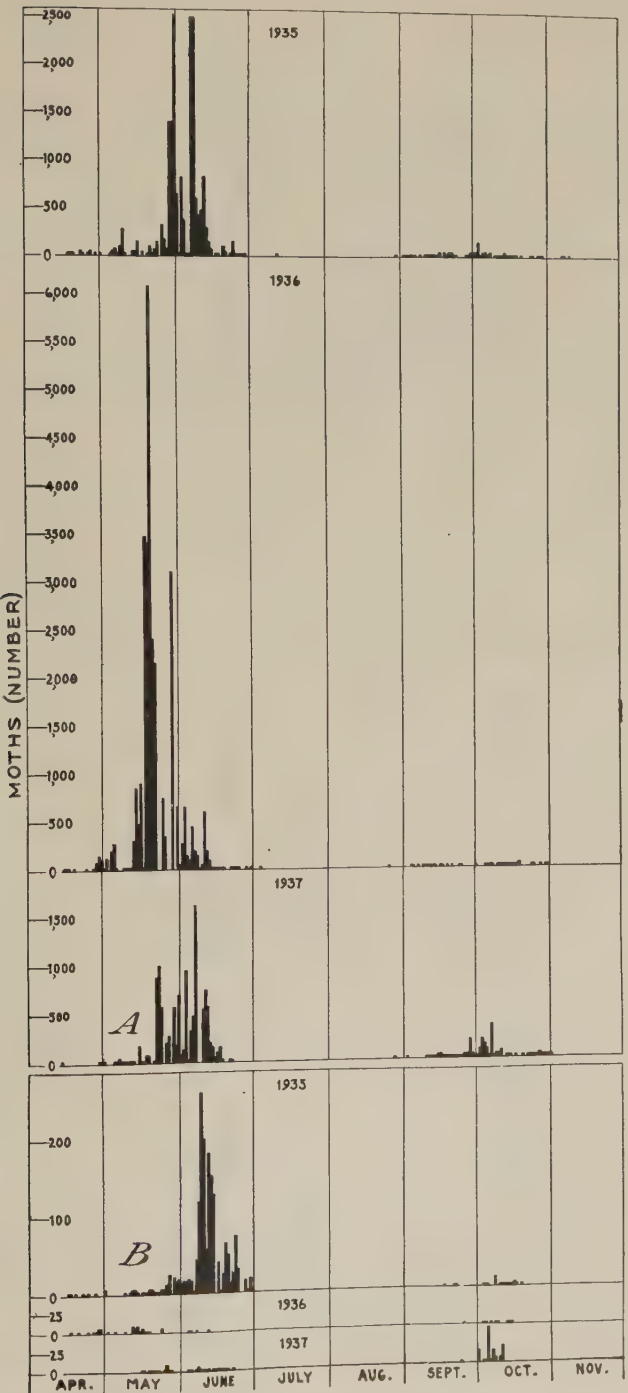


FIGURE 6.—Seasonal flight of *Chorizagrotis auxiliaris* at Garden City, Kans. (*A*), and at Manhattan, Kans. (*B*), 1935–37.

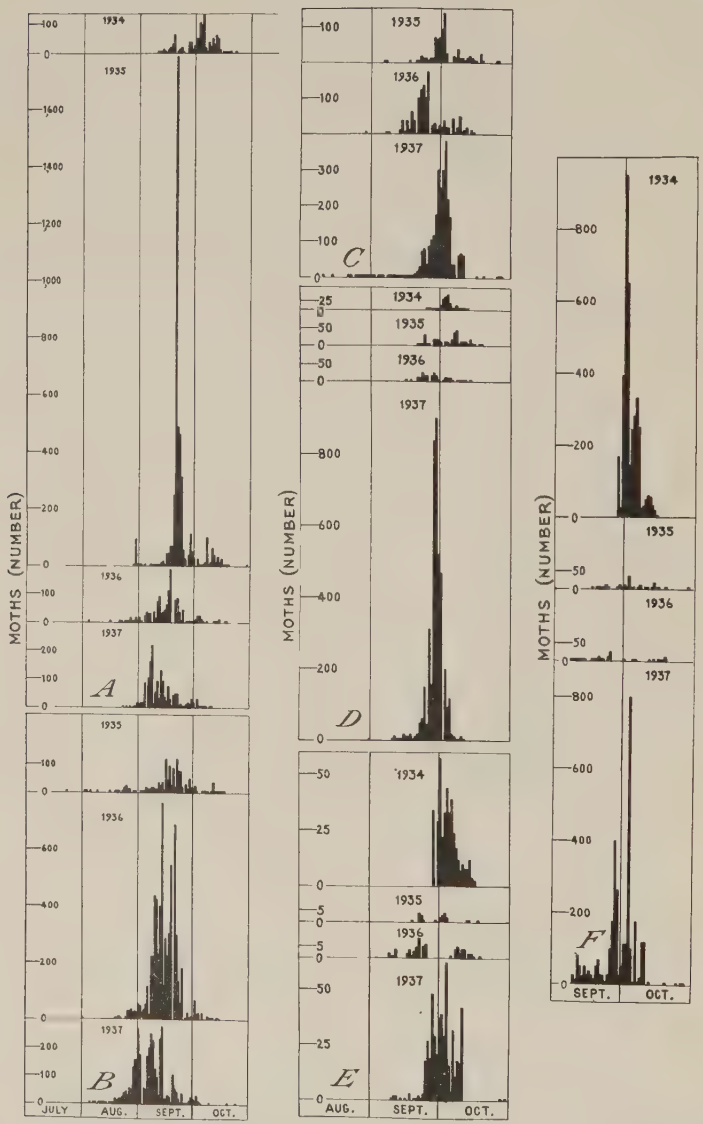


FIGURE 7.—Seasonal flight of *Feltia subgothica* at Manhattan, Kans. (*A*), and at Lincoln, Nebr. (*B*), *Agrotis venerabilis* at Lincoln (*C*), *A. gladiaria* at Manhattan (*D*), *A. orthogonia* at Garden City, Kans. (*E*), and *Euxoa niveilinea* at Garden City (*F*), 1934–37.

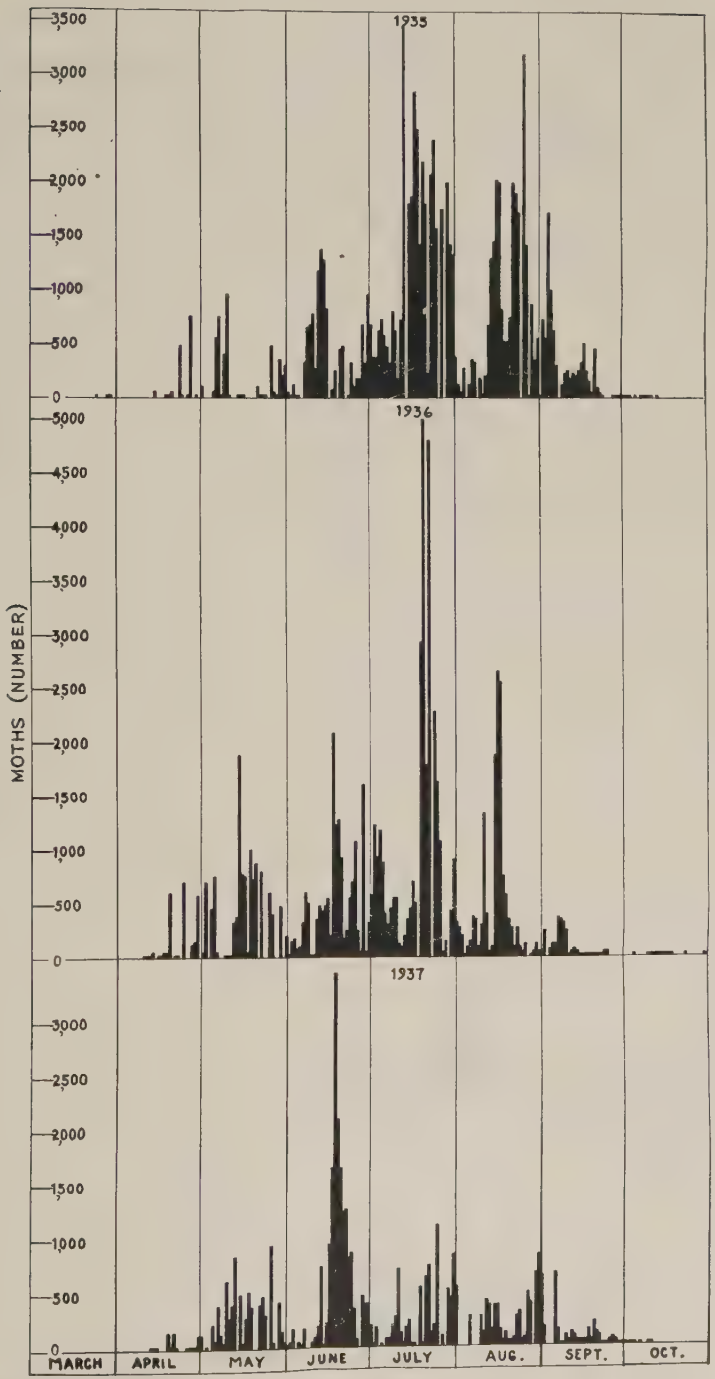


FIGURE 8.—Seasonal flight of *Scotogramma trifolii* at Garden City, Kans., 1935–37.

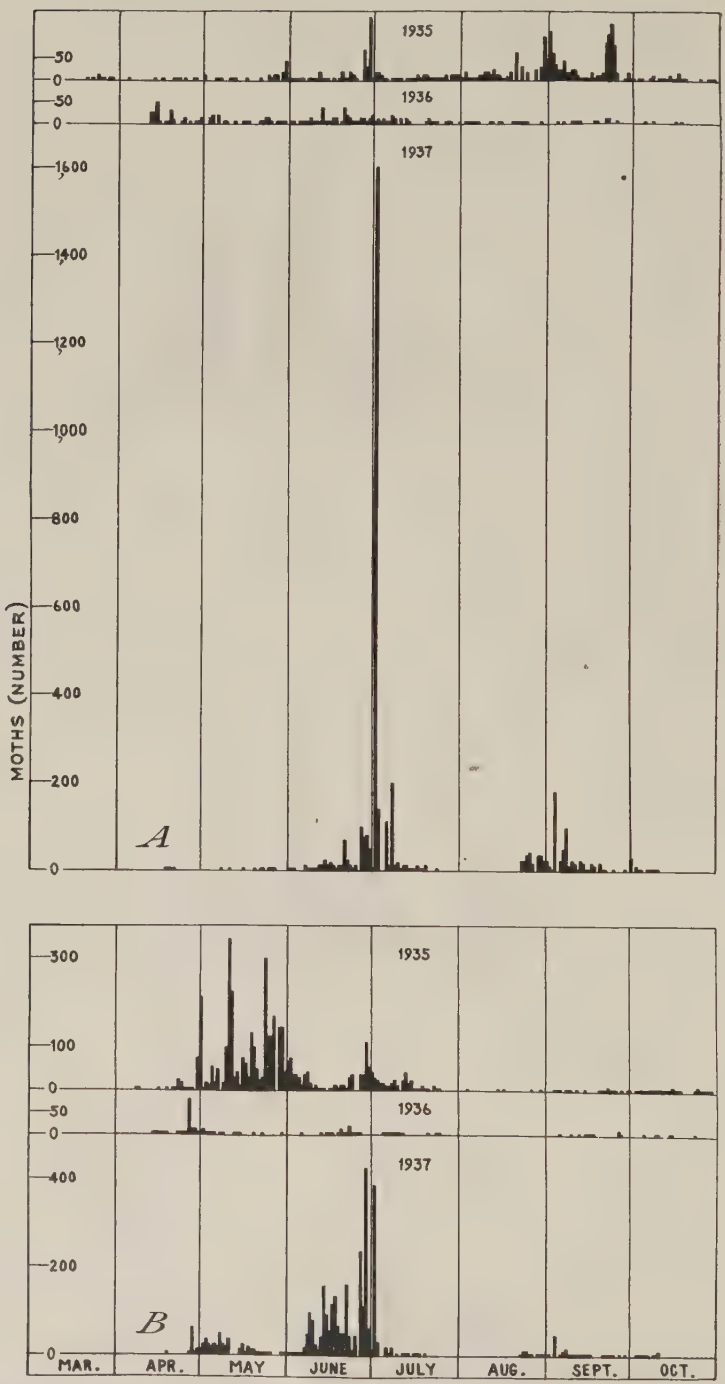


FIGURE 9.—Seasonal flight of *Caenurgina erechtea* and *C. crassiuscula* (*A*), and *Leucania unipuncta* (*B*), at Manhattan, Kans., 1935–37.

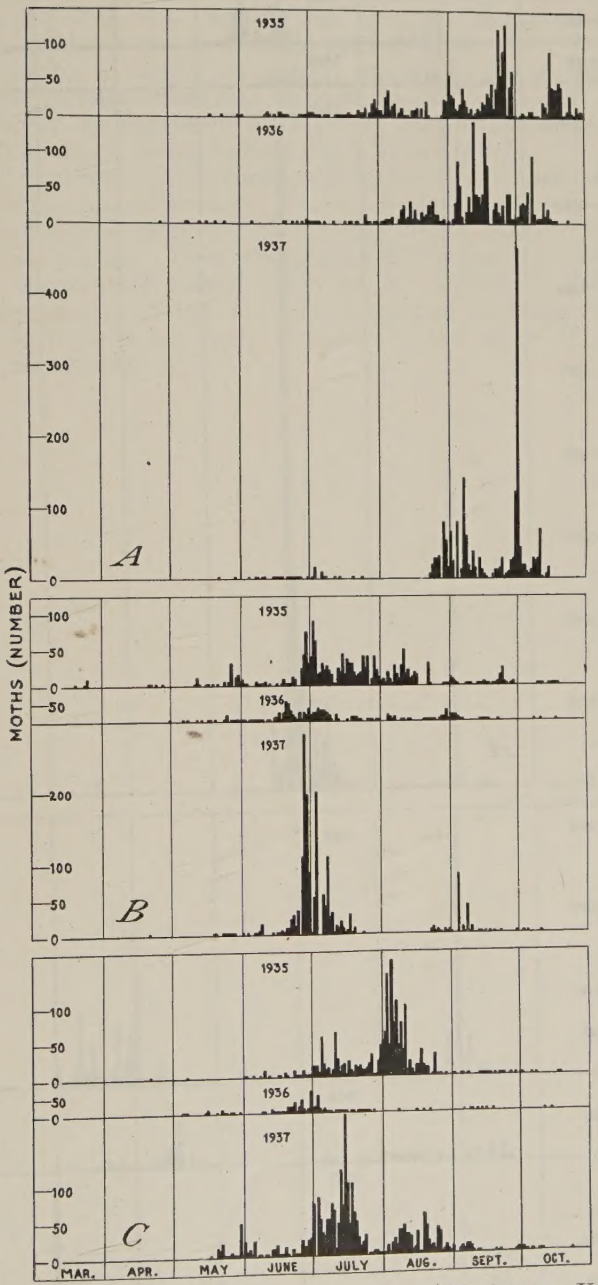


FIGURE 10.—Seasonal flight of *Heliothis armigera* at Manhattan, Kans. (*A*), and of *Prodenia ornithogalli* at Manhattan (*B*), and at Lincoln, Nebr. (*C*). 1935–37.

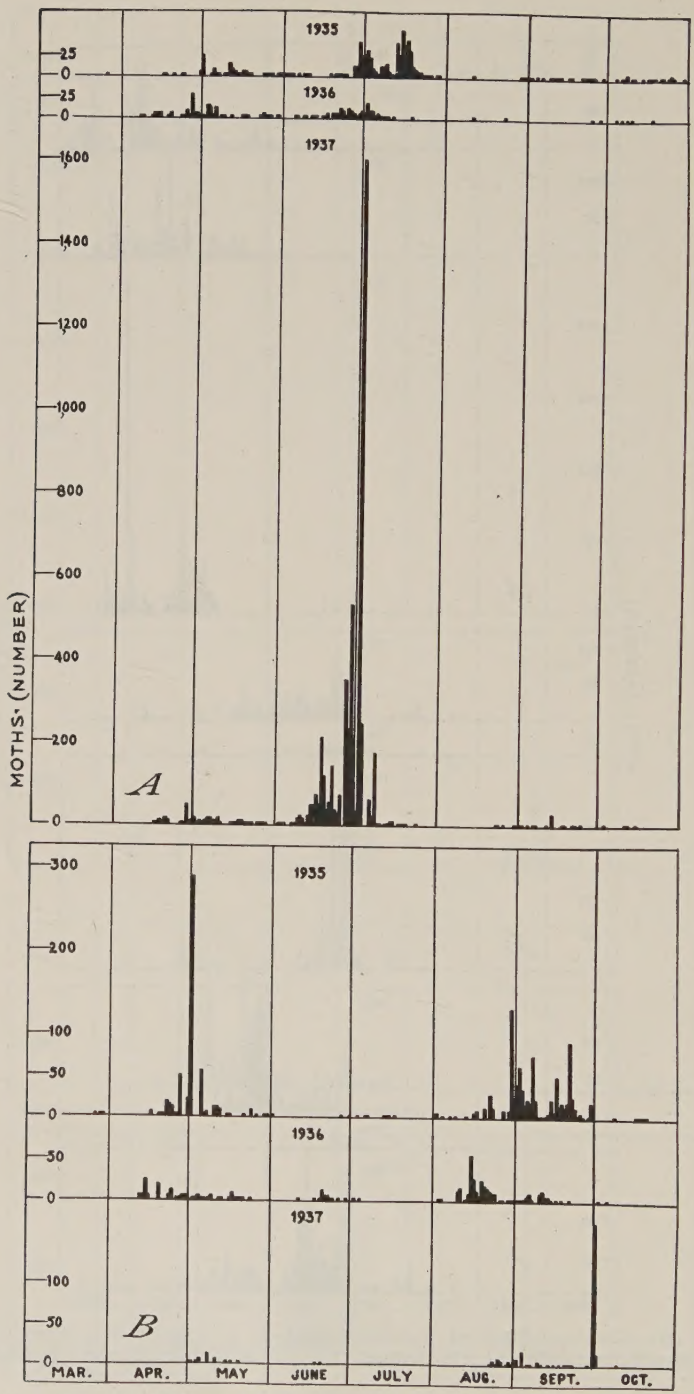


FIGURE 11.—Seasonal flight of *Peridroma margaritosa saucia* (*A*) and *Protoleucania albilinea* (*B*) at Manhattan, Kans., 1935–37.

and from year to year, and also as to the time of year when the greatest period of flight occurred. In general, however, flights of individual species showed the same trend in all the localities.

Species having a single generation annually had a rather short flight period, usually from late August to early October. *Chorizagrotis auxiliaris*, an exception to this rule, had an enormous flight in May and June and a much lighter flight in the fall.

Owing to overlapping of broods, the flights of the different generations of multiple-generation species were not clearly defined. *Heliothis armigera* was scarce early in the season, with a marked increase in abundance in the fall. Peak abundance of *Prodenia ornithogalli* and *Peridroma margaritosa saucia* occurred in midseason, followed by comparative scarcity in the fall. *Protoleucania albilinea* showed two distinct flight periods, one early in May and the other late in August or early in September.

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